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EXAMINER

ROSENBERGER, FREDERICK F

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/535,157	Applicant(s) EGGERS ET AL.	
	Examiner Frederick F. Rosenberger	Art Unit 2884	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 March 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 and 9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 May 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. Applicant's reply, filed 1 March 2007, has been received and entered.

Accordingly, changes have been made to specification. Claim 1 has been amended.

Claim 8 remains cancelled. No new claims have been added. Thus, claims 1-7 and 9 remain currently pending in this application.

2. Applicant's amendment of the specification has successfully overcome the objections to the specification, as detailed in paragraphs 3-5 of the previous Office action. Applicant's amendment of the claims has successfully overcome the objection to claim 1, as detailed in paragraph 6 of the previous Office action. Applicant's amendment of claim 1 has successfully overcome the rejection of claims 1-7 and 9 under 35 U.S.C. 112 and 101, as detailed in paragraphs 8 and 10 of the previous Office action.

Response to Arguments

3. Applicant's arguments filed 1 March 2007 have been fully considered but they are not persuasive.

On page 9, applicant makes several arguments regarding the primary reference, Saka et al., used in the rejection of claims 1-7 and 9 under 35 U.S.C. 103(a). First, applicant argues that Saka et al. have nothing to do with the object of the present invention, namely reducing the quantity of data to be evaluated. Contrary to applicant's

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assertions, the reference meets all of the broad limitations as set forth in the rejection below. The fact that Saka does not disclose the same advantage as the present invention does not mean that the reference would not be applicable. However, Saka et al. do recognize reduced processing as a result of the disclosed method (see column 3, lines 27-31). Further, both of the secondary references, Morizane et al. and Yamada, are directed to reducing the quantity of data to be evaluated. Thus, the combination of Saka et al. with the secondary references would achieve the object of the present invention.

Second, applicant argues that Saka et al. shows a binarization of a part of the image which is different than dividing the perception region into plural component regions. It is agreed that Figure 10 of Saka et al. does not show division of perception region into plural component regions. Rather, Figure 10 is an example of the processing which would occur within one of the component regions. The Office action mailed on 22 January 2007 makes this explicit when processing area **30** in Figure 12 is cited as a component region wherein evaluation would take place and the region external to processing area **30** would be another component region that do not have an evaluation.

Third, applicant argues that the perception region is determined before an object is detected. However, this limitation cannot be found in the claim 1. In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., determining the perception region prior to object detection) are not recited in the rejected claim(s).

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Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

As such, the examiner believes that Saka et al. would still be pertinent to the rejections. Thus, Saka et al. has been used in the rejections provided below.

4. It is noted that applicant has amended claim 1 to delete limitations and include new limitations not present in the original claim. The limitation for evaluation taking place in one component region but no evaluation taking place in another has been deleted. Limitations for issuing a warning to the drive and evaluation based on the division of the perception region have been added. Thus, the new reference to Morcom (WO 02/082201) has been used in the rejections below to account for the amendments.

Claim Objections

5. Claim 1 is objected to because of the following informalities:

In the last line of claim 1, the recitation of "the evaluation" is unclear as different types of evaluations have been specified in the claim, i.e. multistage evaluation of line 12 of the amended claim and specific evaluation of lines 17-18 of the amended claim.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

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6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morcom (International Patent Application Publication WO 02/082201) in view of Morizane et al. (US Patent Application Publication # 2002/0026274) and Yamada (US Patent # 6,369,700).

With regards to claim 1, Morcom discloses a method for sensing the surroundings in front of a vehicle by means of a surroundings sensor system (Figure 5) in which surroundings data is obtained by means of a surrounding sensor 72, and objects are detected by processing the surroundings data (page 15, lines 9-16), the method comprising:

Determining a perception region in which objects are detected corresponding to a region sensed by the surroundings sensor (Figure 7);

Dividing the perception region into a plurality of component regions (page 17, lines 28-32);

Subjecting the surroundings data to a multi-stage evaluation based on the division of the perception region, wherein unsafe volume component region **96** is subject to a specific evaluation but the safe distance component region **98** is subject to no evaluation (page 18, lines 28-31) or multiple component regions subject to different evaluations (page 15, lines 9-16); and

Issuing a warning to a driver of the vehicle in the form of visual indications based on the result of the evaluation (page 19, lines 27-29).

Morcom does not specifically disclose that the perception region is restricted to a lane prior to division into component-regions. Morcom does teach restricting the region to the volume of travel by the car (Figure 7), but does not specifically require this volume to be bounded by the lane. Morizane et al. teach an imaging system for adaptive cruise control (abstract) wherein a lane of travel of the vehicle is recognized prior to image processing of the data (paragraphs 49 and 55). Morizane et al. do not specifically discuss a motivation for such a modification.

However, Yamada teaches a system for obstacle detection for use with an automobile wherein the relevant data analyzed by the system is restricted to the lane of travel. As discussed by Yamada, such a modification allows for reduced processing time as the amount of data to be analyzed is reduced to the most relevant data (column

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1, lines 42-60). Although Yamada discusses these advantages with regards to a radar system, these advantages would be equally applicable to the imaging system proposed by Morcom and Morizane et al.

As such, it would have been obvious for a person having ordinary skill in the art at the time the invention was made to modify Morcom to restrict the perception region to the lane of travel prior to any image processing, so as to reduce processing time, as taught by Morizane et al. and Yamada.

With regards to claim 2, Morizane et al. teaches that the lane is defined by lane detection via image processing (paragraph 49; Figure 7).

9. Claims 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morcom, Morizane et al., and Yamada, as applied to claim 1 above, and further in view of Nishigaki et al. (US Patent # 6,775,395).

The combination of Morcom, Morizane et al., and Yamada disclose all the limitations of parent claim 1, as discussed above. However, the combination does not specifically recite the limitation of a predefined tolerance region added to the limits of the lane. Morizane et al. do not mention a tolerance region around the lane delimiter. Yamada appear to teach a lane range which extends onto the shoulder of the road (Figure 6), but fail to explicitly discuss any tolerance region.

However, tolerances are often included in engineering applications to account for variations in system components. As Nishigaki et al. suggest, tolerances are often included in image processing and distance calculations in an object recognition system

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(column 7, lines 1-19). Although such tolerances apply to the calculation of distances, one of ordinary skill in the art would recognize the need for tolerances, especially in view of variations in pixel performance (column 7, lines 3-5) as well as the possible location of relevant objects just outside or between lanes (see, for example, Maekawa, Figure 6).

Thus, it would have been obvious for a person having ordinary skill in the art at the time the invention was made to incorporate a tolerance region with the lane, so as to account for variations in imaging performance, as taught by Nishigaki et al., and to account for relevant objects outside or between lanes.

Also, in regards to the size of the perception region (i.e. lane region + tolerance region), the limitations of the claim can be construed as a discussion of optimum value for the perception region. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a perception region equal to a lane region plus a tolerance region, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272,205 USPQ 215 (CCPA 1980).

10. Claims 4-6 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Morcom, Morizane et al., and Yamada, as applied to claim 1 above, and further in view of Saka et al. (US Patent # 6,792,147).

The combination of Morcom, Morizane et al., and Yamada teach all the limitations of parent claim 1, as discussed above.

With regards to claims 4 and 5, Morcom discloses that objects are detected using the disclosed sensor system, but does not specifically teach that the object perception is achieved by image processing methods or that object classification occurs to rule out false alarms. Morcom does allow for some image processing in terms of correlating measured object distances with visual images for warning conveyance (page 10, lines 24-27 and page 18, lines 21-26), wherein object distance is determined through NIR measurements (page 15, lines 29-31). Further, Morcom does allow for image acquisition for conveying to the driver (page 11, lines 21-31).

Saka et al. disclose an object recognition system for use in object perception, wherein an infrared image sensor detects IR light reflected from an object (column 4, lines 55-56). Saka et al. further teach that the data obtained by the image sensor is processed to allow for object recognition of the vehicle ahead (column 6, lines 19-33). Saka et al. further disclose that the object classification is carried out by image processing methods, specifically horizontal edge evaluation techniques, so as to classify the object as a relevant vehicle or irrelevant (column 9, lines 25-43), thus ruling out false alarms.

Thus, it would have been obvious for a person having ordinary skill in the art at the time the invention was made to provide object recognition and classification via image processing techniques so as to rule out false alarms, as taught by Saka et al.

With regards to claim 6, Morcom discloses determining the distance to objects (page 11, lines 7-14).

With regards to claim 9, the combination of Morcom, Morizane et al, and Yamada is silent with regards to the surroundings sensing system being a night vision system. However, Morcom does disclose the use of NIR wavelengths, which are used in night vision systems, to allow for use in rain, snow, and fog. Saka et al. teaches that imaging systems employed for object recognition in a vehicle can employ infrared systems so as to allow for nighttime use (column 4, lines 50-56). Thus, it would have been obvious for a person having ordinary skill in the art at the time the invention was made to provide an IR vision system so as to allow for object recognition at night, as taught by Saka et al.

11. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Morcom, Morizane et al., Yamada, and Saka, as applied to claim 4 above, and further in view of Falbish et al. (European Patent Application Publication # 0544468 A2).

The combination of Morcom, Morizane et al., Yamada, and Saka disclose all the limitations of claim 4, as discussed above. It is noted that claim 7 does not depend upon claim 4, but claim 4 contains limitations regarding object perception relevant to the limitations of claim 7. However, the combination does not specifically recite the limitation of sensing the movement of objects. Saka et al. teaches determination of location and distance, but does not specifically mention calculating the velocity of objects. Both Morizane et al. and Yamada contain similar disclosures in that regard.

Falbish et al. teach an object tracking system (Figure 1) for use with a vehicle similar to that proposed by Saka et al. (Figure 1; column 4, line 60 – column 5, line 15). Falbish et al. further teach that such a system can be used to track a number of targets

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and to calculate the velocity of the object (column 11, lines 44-51). As would be evident to one of ordinary skill in the art, such information could be used to differentiate between moving vehicles and stationary vehicles, which could be used in the determination of collision scenarios.

Thus, it would have been obvious for a person having ordinary skill in the art at the time the invention was made to provide tracking of targets by calculation of target velocity, as taught by Falbush et al., so as to provide information between moving and stationary vehicles for collision assessment analysis.

Conclusion

12. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.


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13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Frederick F. Rosenberger whose telephone number is 571-272-6107. The examiner can normally be reached on Monday - Friday with flexible hours.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on 571-272-2444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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